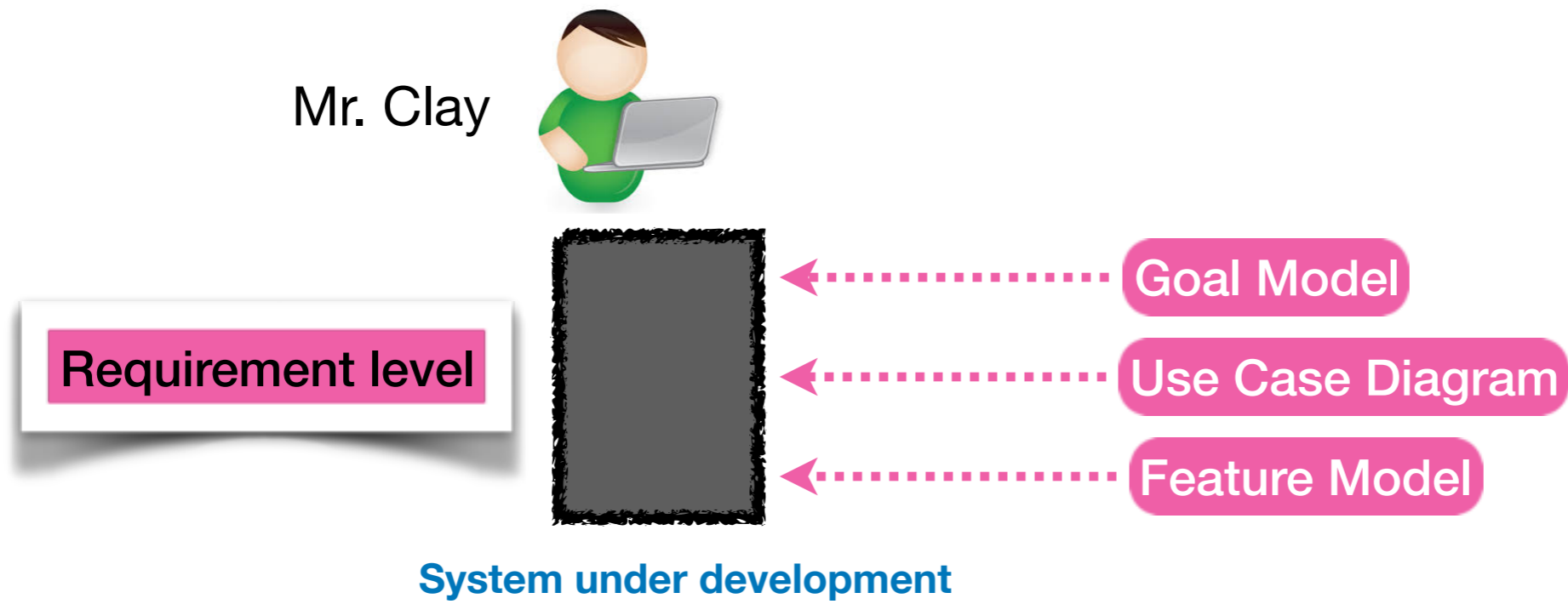


Towards Modular Combination and Reuse of Languages with Perspectives

Hyacinth Ali, Gunter Mussbacher, and Jörg Kienzle

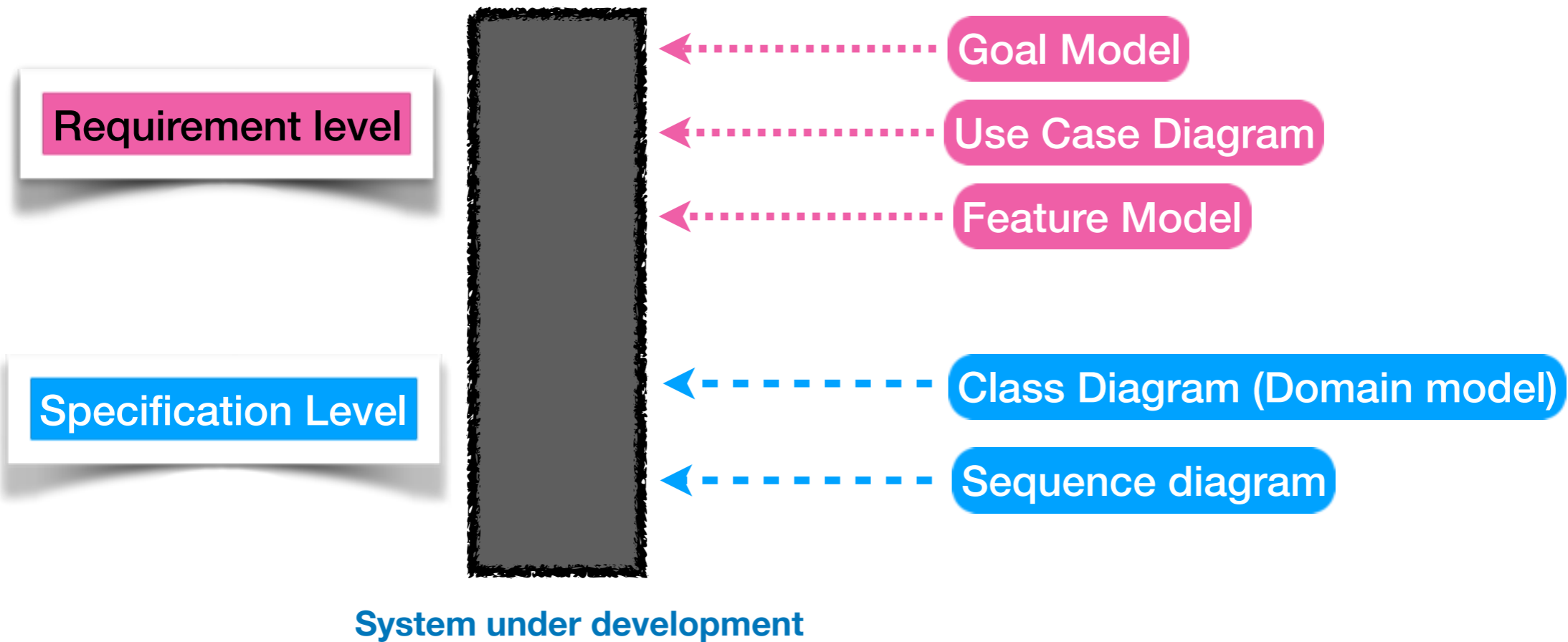


Complex Systems Rely on Multiple Languages



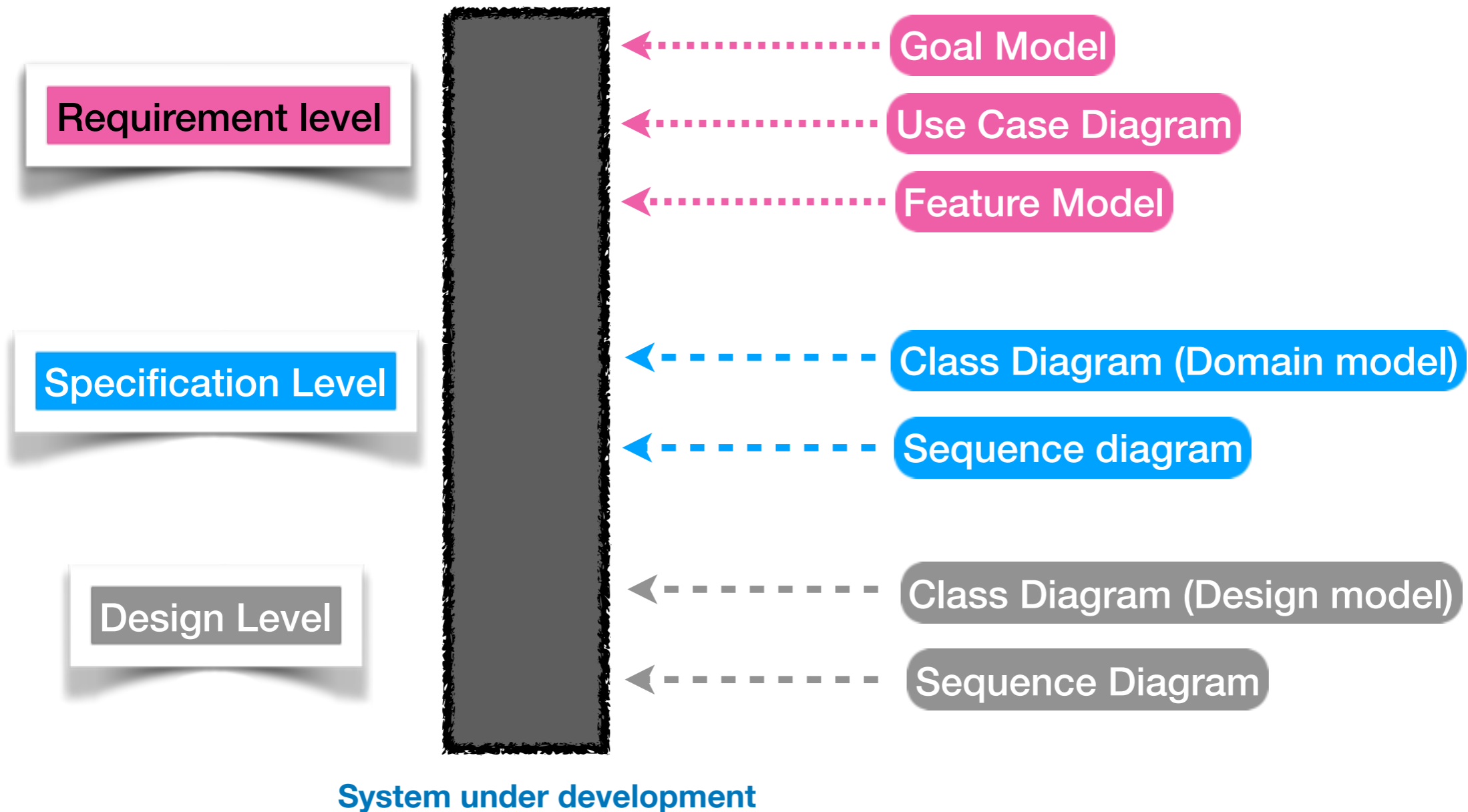
Complex Systems Rely on Multiple Languages

Mr. Clay

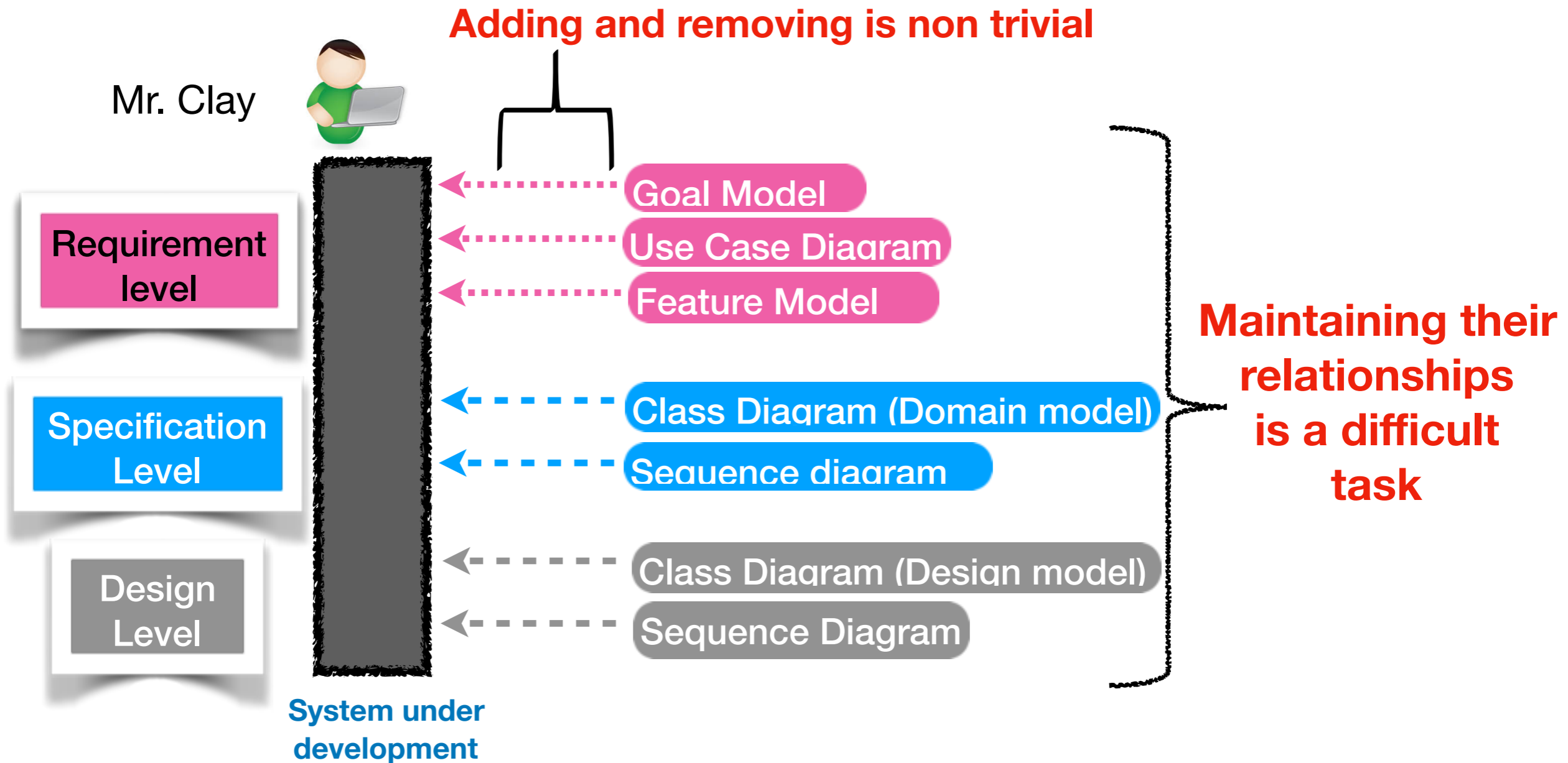


Complex Systems Rely on Multiple Languages

Mr. Clay



Coherent Use of the Languages is **Difficult**



Perspectives for Multi- Language Systems (PML)



Perspectives for Multi- Language Systems (PML)

**Perspective groups languages
for a given purpose**

Focus of a Perspective

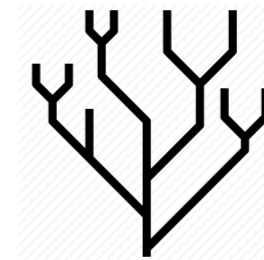
Language metamodel

&

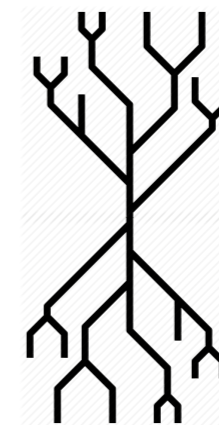
Construction semantics (perspective actions)

Types of Perspective

Single-Language Perspective



Multi-Language Perspective



Single-Language Perspective

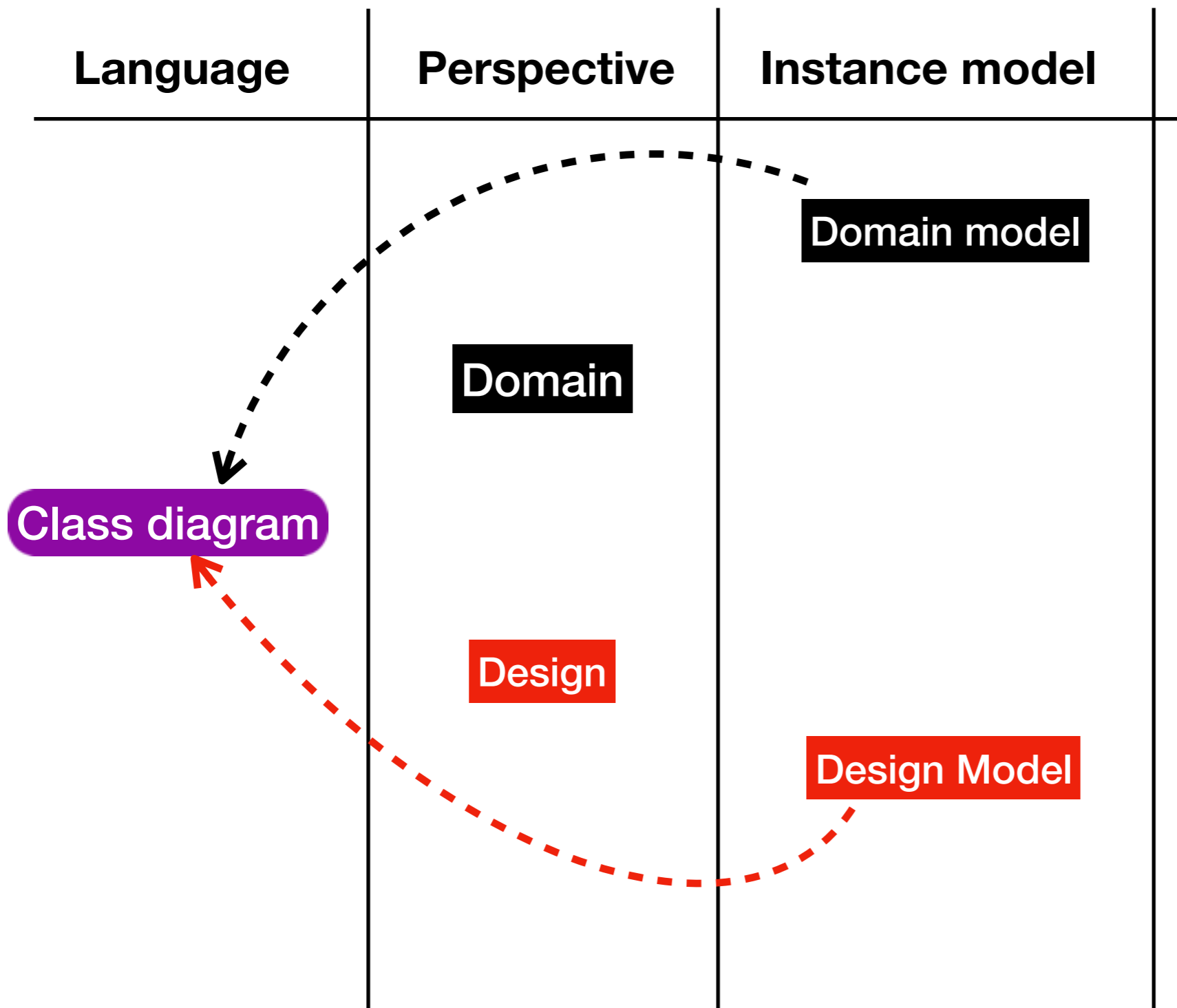
Language

Class diagram

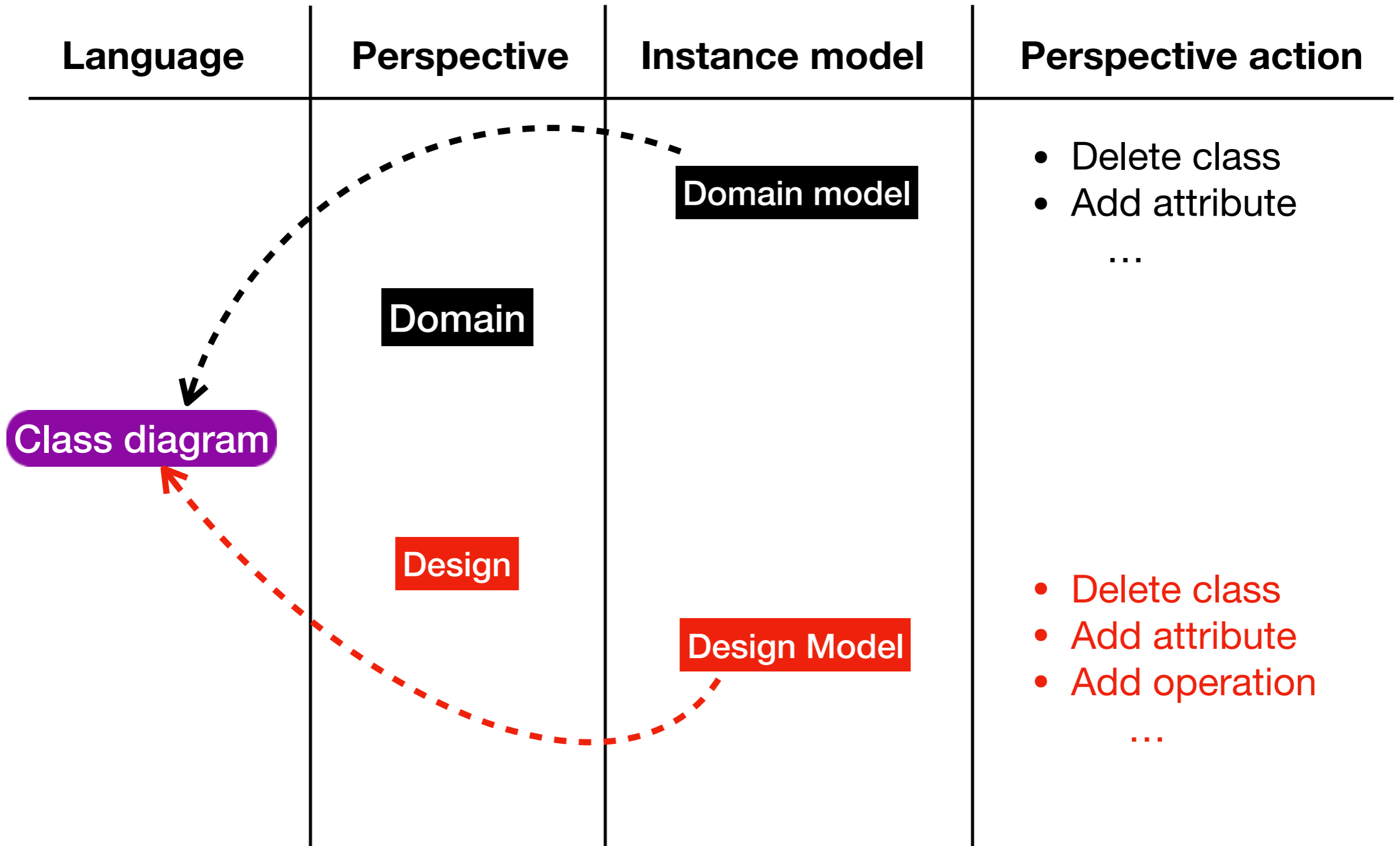
Single-Language Perspective

Language	Perspective
Class diagram	Domain
	Design

Single-Language Perspective



Single-Language Perspective



Multi-Language Perspective

Language

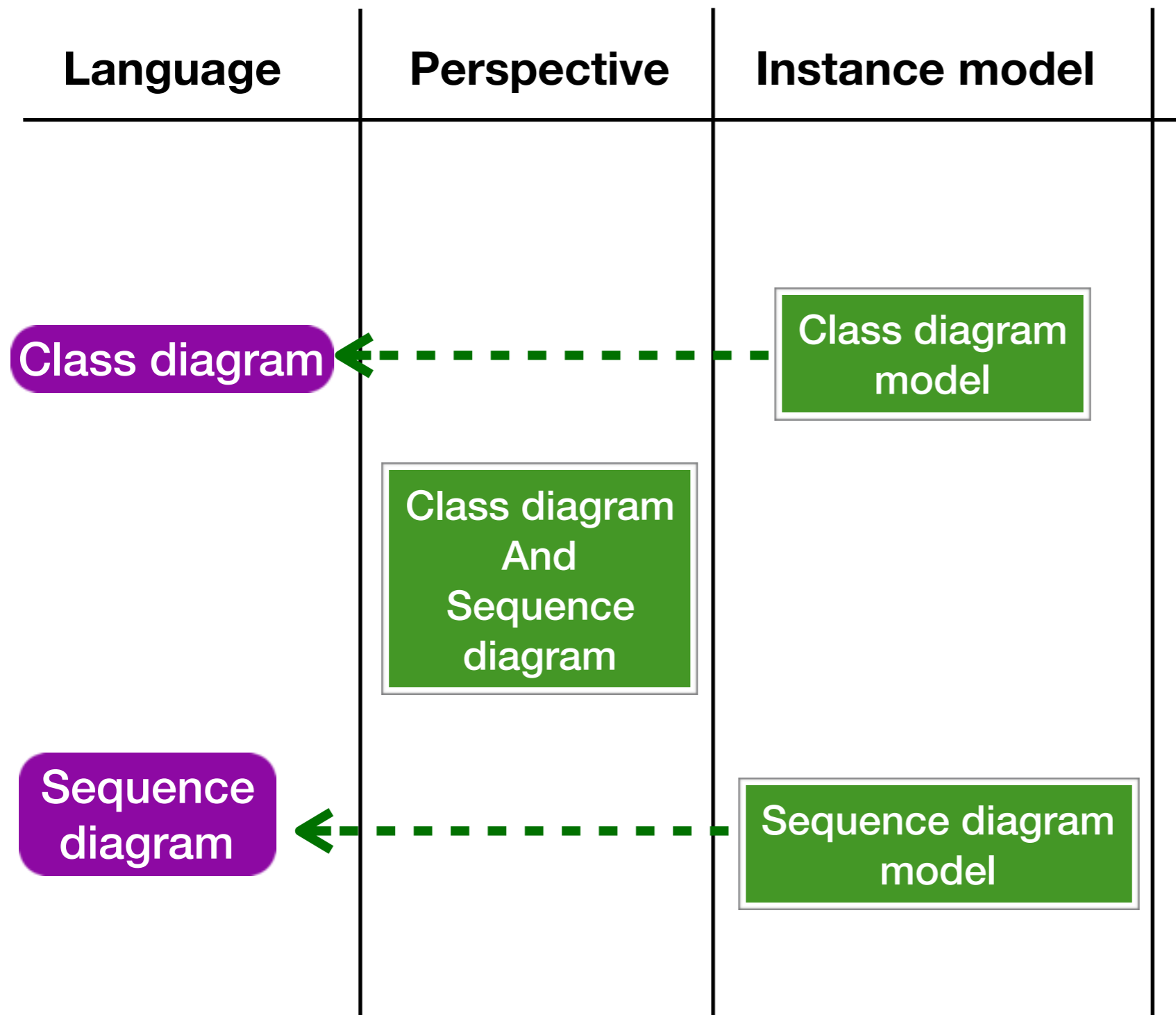
Class diagram

**Sequence
diagram**

Multi-Language Perspective

Language	Perspective
Class diagram	Class diagram And Sequence diagram
Sequence diagram	

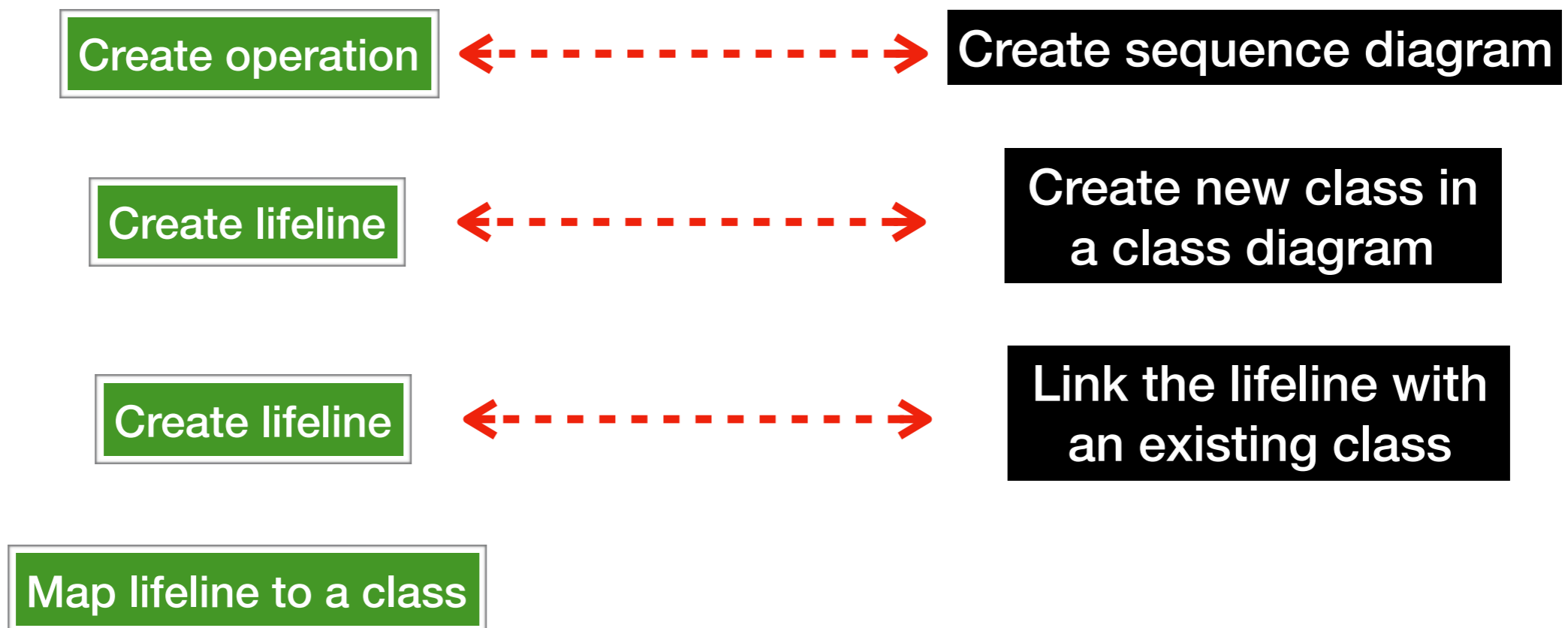
Multi-Language Perspective



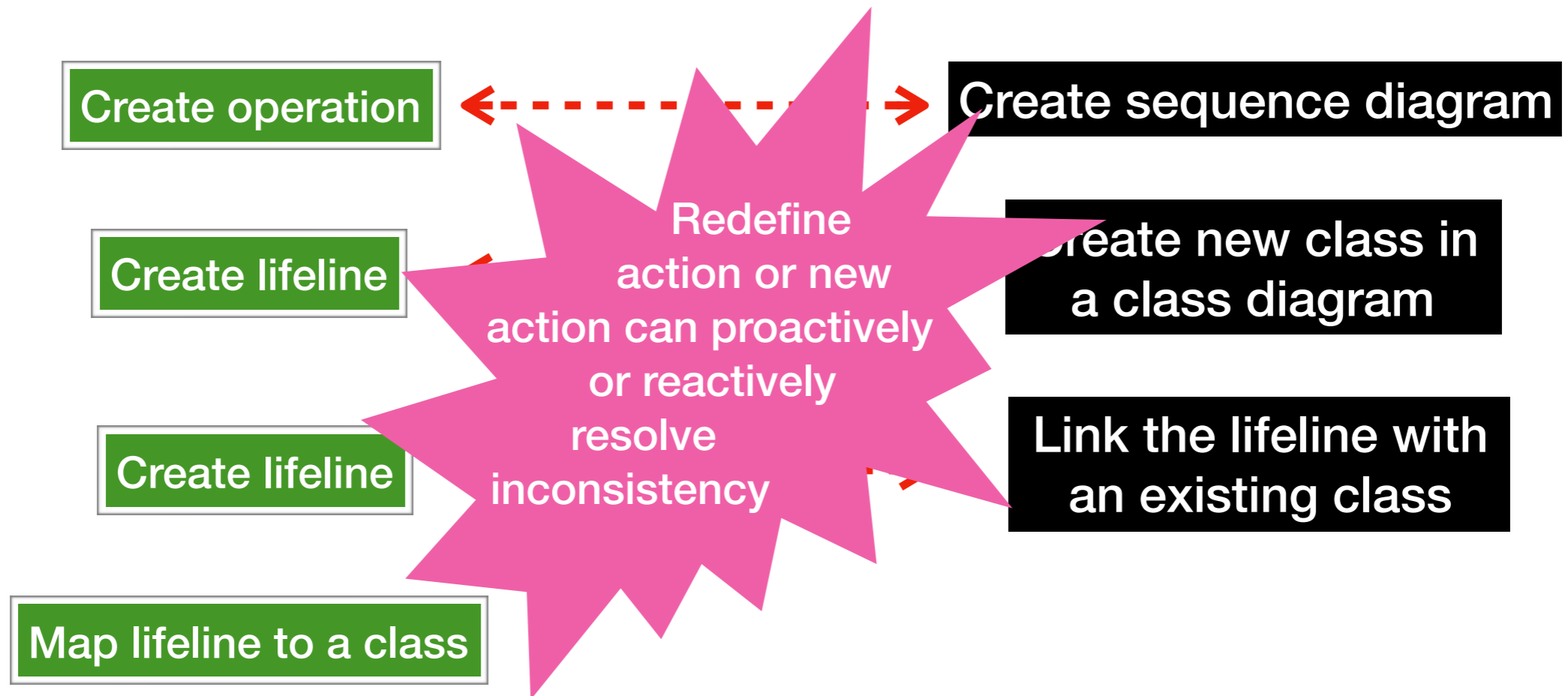
Multi-Language Perspective

Language	Perspective	Instance model	Perspective action
Class diagram	Class diagram And Sequence diagram	Class diagram model	<ul style="list-style-type: none"> • Create class } <i>re-expose</i> • Create attribute } <i>re-expose</i> • Create operation <i>redefine</i> • Map two elements <i>new action</i>
Sequence diagram		Sequence diagram model	<ul style="list-style-type: none"> • Create statement <i>re-expose</i> • Create lifeline <i>redefine</i> • Map two elements <i>new action</i>

Expressing Rules Using Perspective Action



Expressing Rules Using Perspective Action



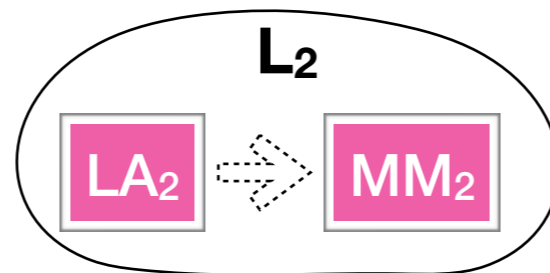
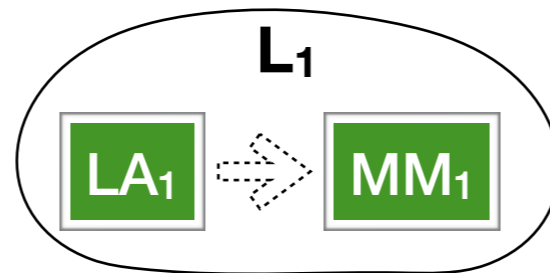
PML Framework

Language level

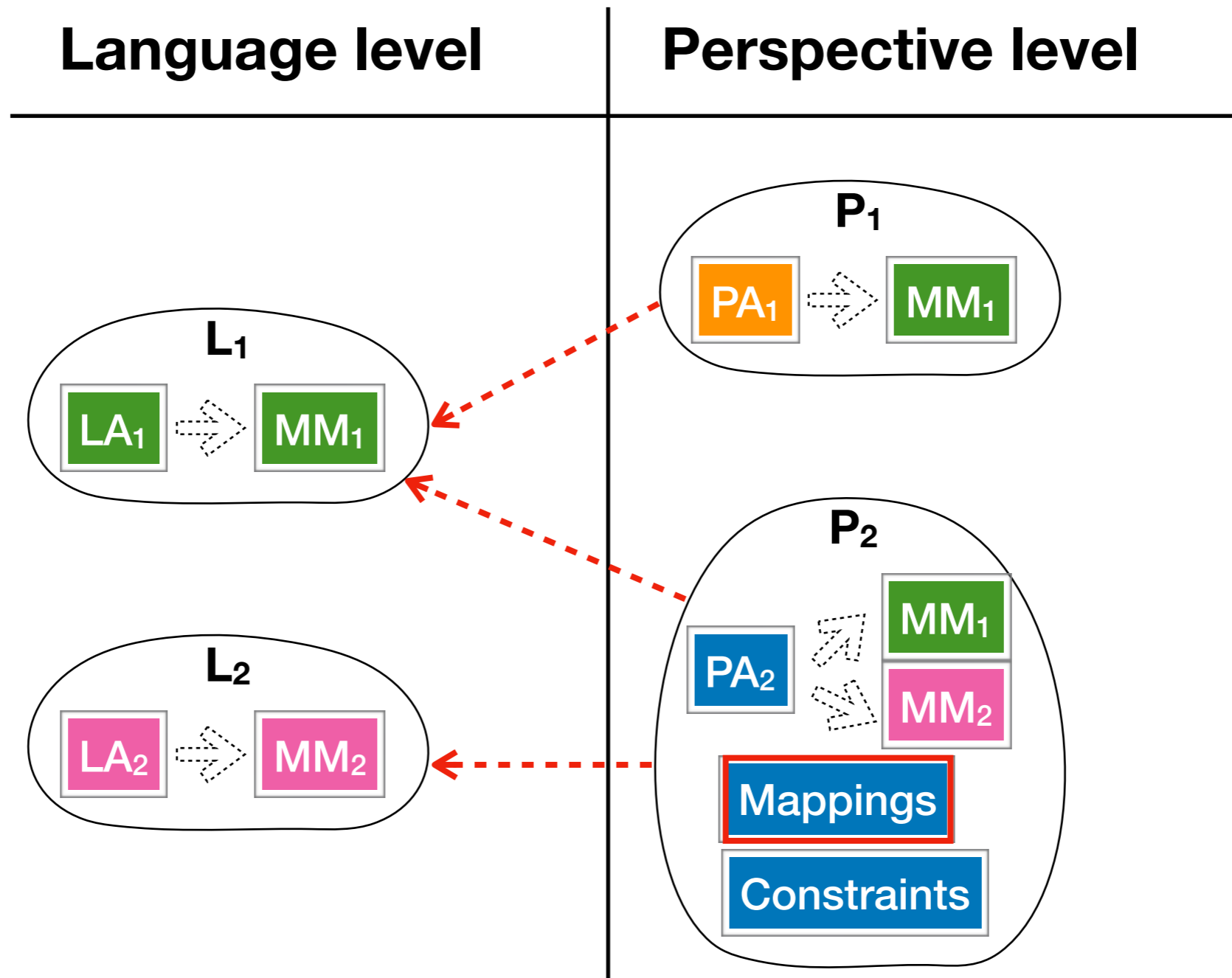
Perspective level

Model level

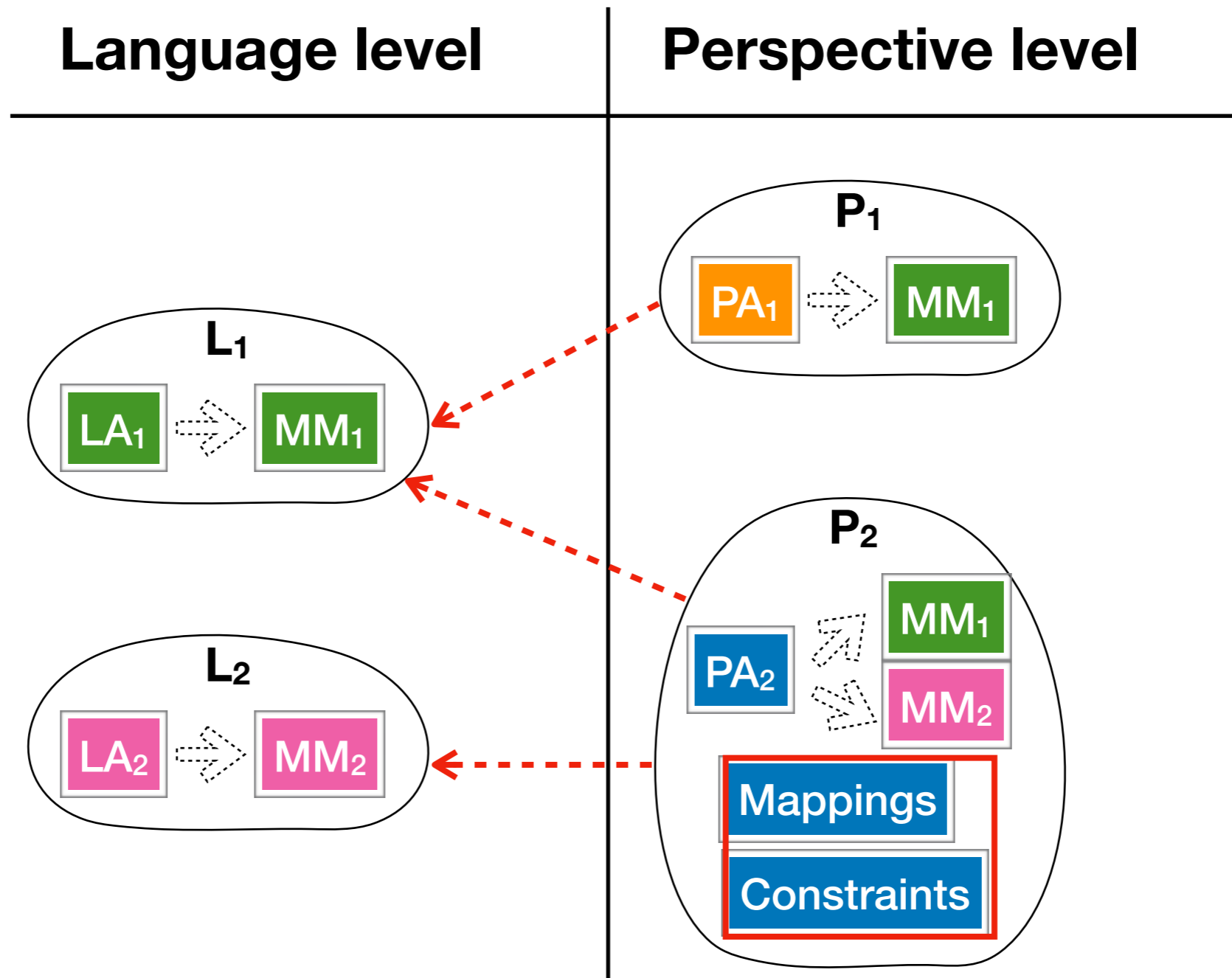
PML Framework: Language Level



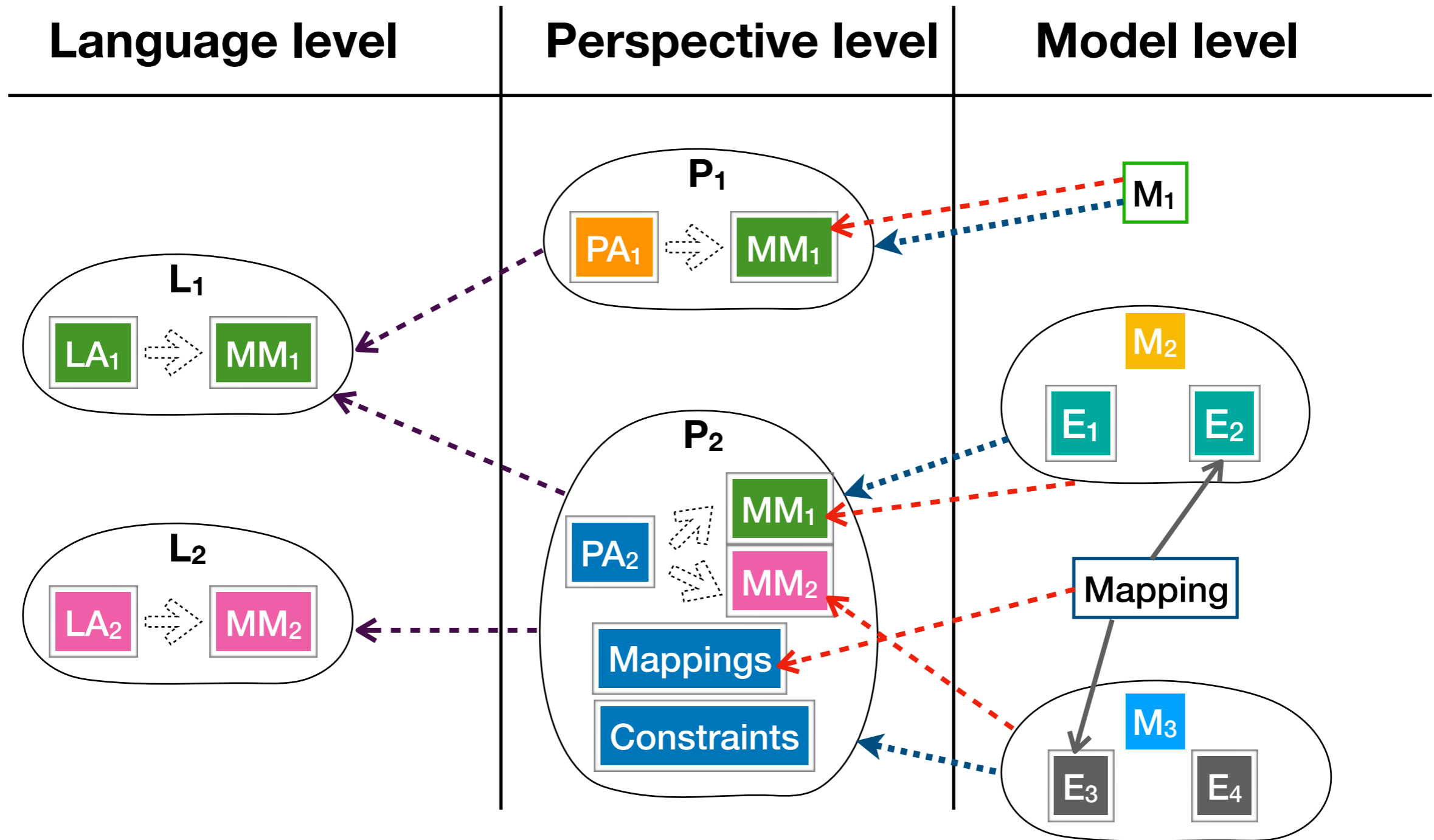
PML Framework: Perspective Level



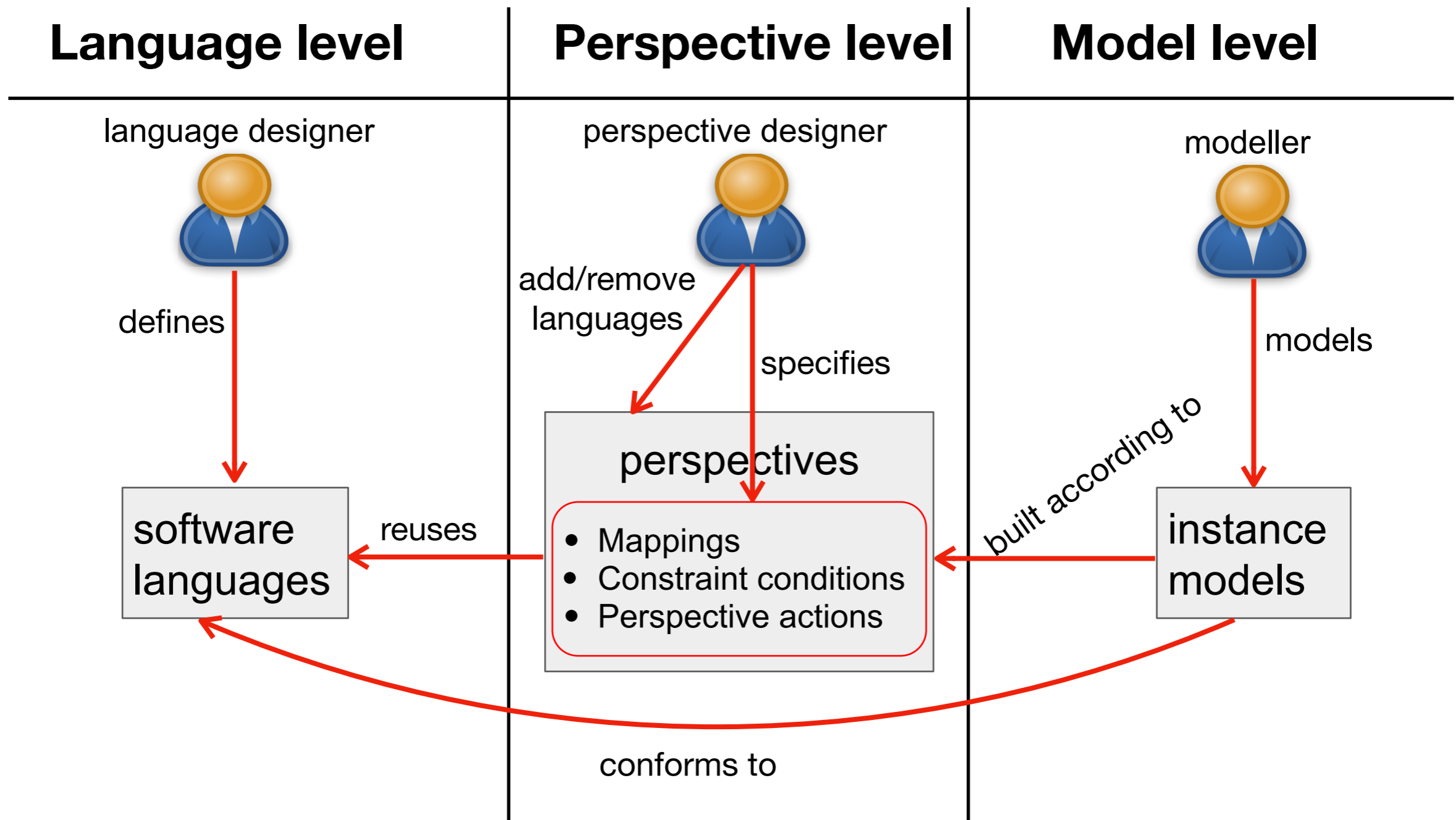
PML Framework: Perspective Level



PML Framework: Model Level

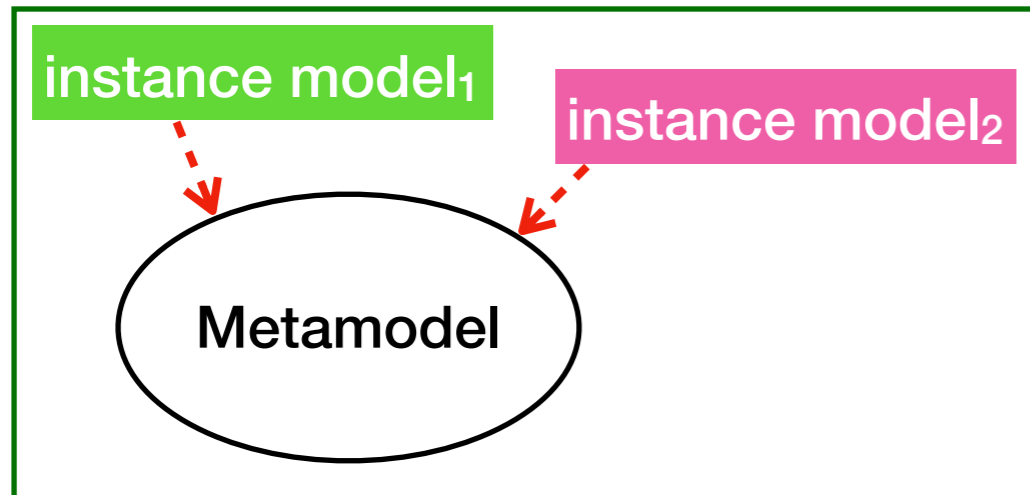


PML Process and Roles



Some Related Works

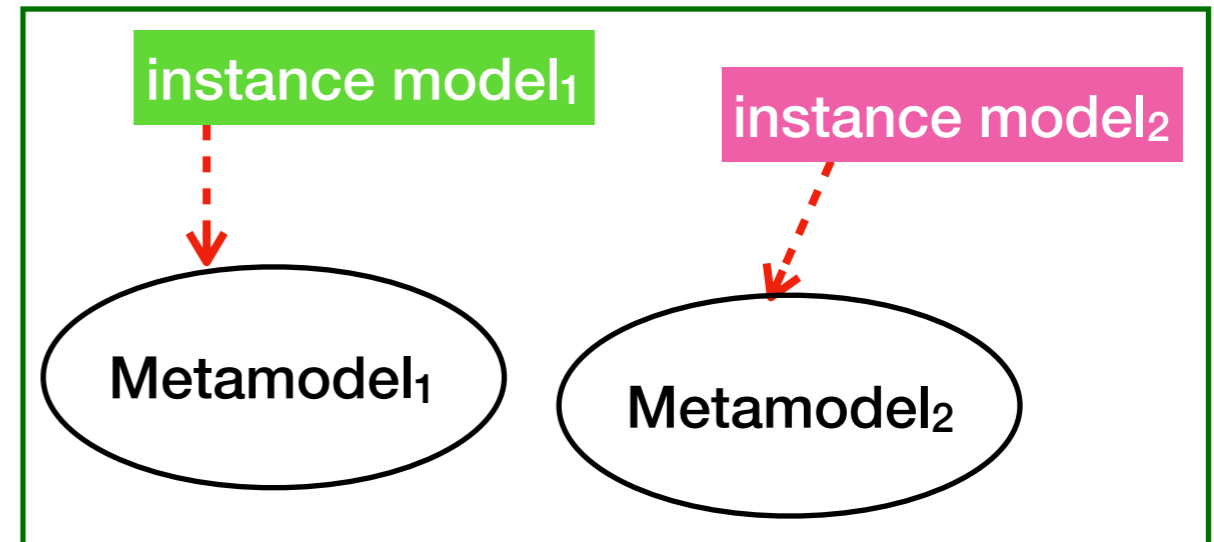
SUM



- **Vitruvius**
 - Reactive response
- **PML**
 - Reactive and proactive response

VSUM (Vitruvius/PML)

VSUM



- Adds flexibility to maintain consistency
 - By using language actions (perspective action)
 - Perspective actions can prevent and/or repair broken consistency

PML

In Conclusion

